# APPENDIX AAPPENDIX A

## 40 CFR 61, SUBPARTS A AND H, REQUIREMENTS CHECKLIST

## PREFACE TO CHECKLIST

An attempt has been made to make the attached checklist as easy to use as practical. On the checklist there are both requests for documents, and questions. Of these, some are for information purposes only. The information or documents sought may enable EPA to determine whether the facility is in compliance with section 112 of the Clean Air Act and implementing regulations; the information may also be needed to determine what the future regulatory status of the facility will be. However, a yes or no answer to these "information only" requests and questions does not per se indicate that the facility is in or out of compliance. These requests and questions are marked with a "☐," which may be checked once the question is answered or the documents provided.

The balance of the questions bear directly on whether the facility is in compliance with the act and the regulations, e.g., is there a QC plan, is there certain monitoring, etc. The answers to these questions may be checked in the "yes" and "no" columns on the left, under "Compliance Factor." A space is provided for comments.

| ITEM | COMPLIANCE FACTORS | | | RADIONUCLIDES NESHAPS COMPLIANCE CHECKLIST | |
|---|---|---|---|---|---|
| | YES | NO | COMMENTS | | |
| | I. BACKGROUND INFORMATION:<br><br>[Note: The purpose of this section of the checklist is to determine generally what requirements of the Clean Air Act, as amended in 1990 (CAA), currently apply and may give rise to other requirements in the future.] | | | | |
| 1. | | | ☐ | 1. | Identify each operation at the facility using or generating radionuclides and each building or structure within which radionuclides are used or generated. |
| 2. | | | | 2. | List existing releases of radionuclides from each building or structure, or as a result of any operation taking place at the facility, including the following information for each release: source, form of release (gas, liquid, or solid, including range of particulate size if solid), emission rate (Ci/yr or Ci/second), and radionuclide released. |
| 3. | | | ☐ | 3. | What are the estimated fugitive radionuclide emissions from the facility? Which radionuclides are so emitted and from what area or areas (location and size) do such emissions emanate? |
| 4. | | | | 4. | What permits, consent decrees, orders, etc. currently in effect apply to radionuclide emissions from the facility? Please provide copies of same. |
| 5. | | | | 5. | Provide a map of the facility and any other explanatory material sufficient to show (1) the location and height of vents and stacks from which the emissions listed in response to Item 2, above, are released, (2) which radionulides are emitted from each vent or stack and emission rates for each radionuclide from each stack in Ci/yr or Ci/second and the amount of emissions in Ci/cubic meter, (3) locations and size of the offsite and any onsite population and all residences ("any home, house, apartment building, or other place of dwelling which is occupied during any portion of the relevant year" 40 CFR 61.91(d)) schools, businesses, or offices within 3 kilometers. The map should be of sufficient scale to allow determinations of distances from both the perimeter of the facility and from each vent or stack from which radionuclides are released to the receptor. |

| II. COMPLIANCE WITH SECTION 112 CAA AND IMPLEMENTING REGULATIONS (40 CFR PART 61, SUBPARTS A AND H) | | | | | |
|---|---|---|---|---|---|
| 6. | | | | 6.A | Was any building, structure, or any other portion of the facility that emits or has the potential to emit radionuclides, built or modified after December 15, 1989? |
| | | | | 6.B | If so, was approval under the CAA obtained?<br><br>[Note: This is simply the requirement contained in 40 CFR 61.05.] |
| 7. | | | | 7. | If any building, structure, or portion of the facility emitting or having the potential to emit radionuclides had an initial startup after December 15, 1989, were the anticipated and actual startup dates submitted to EPA?<br><br>[Note: This is required by 40 CFR 61.09] |
| 8. | | | | 8. | For any sources that did not have an initial startup date after December 15, 1989, which would include the facility as a whole, was the following information furnished to EPA within 90 days of December 15, 1989: the name and address of the facility owner or operator; the location of the source; the hazardous pollutants emitted by the source; a brief description of the design, operation, nature and size of the source, including the design capacity of the source; each point of emission for each hazardous pollutant; the amount of hazardous materials (average weight/month for the preceding 12 months) the source processes; and a description of the existing control equipment for each emission point, including each control device for each hazardous pollutant and the estimated percentage efficiency for each such device?<br><br>[Note: This information is required by 40 CFR 61.10] |
| 9. | | | | 9. | Did the owner or operator of the facility indicate to EPA that within 90 days of December 15, 1989, that facility could comply with the requirements of 40 CFR Part 61, Subpart H ("Subpart H") ?<br><br>[Note: This information is required by 40 CFR 61.10] |

| | | | | | |
|---|---|---|---|---|---|
| 10. | | | ☐ | 10.A | At what point did it become evident to the facility that it could not comply with Subpart H? |
| | | | ☐ | 10.B | Was a waiver of Subpart H sought pursuant to 40 CFR 61.10? |
| | | | ☐ | 10.C | If so, when was it sought and was it granted? |
| | | | ☐ | 10.D | If it was granted when was it granted, and if it was denied when was it denied? |
| | | | ☐ | 10.E | If it was granted, was it granted for the full two years from the effective date of Subpart H or for some other period? |
| | | ☐ | | 10.F | If for some other period, what was that period? |
| 11. | | | | 11.A | Have there been any waivers granted of the requirement for the initial emissions testing generally required by 40 CFR 61.13? |
| | | | | 11.B | If not, for any source with an initial startup date prior to December 15, 1989, including the facility as a whole, was there emissions testing within 90 days of December 15, 1989? |
| | | | | 11.C | If not, for any building, structure, or other component of the facility emitting or having the potential to emit radionuclides and having a startup date after December 15, 1989, was initial emissions testing performed within 90 days of startup? |
| | | | | 11.D | Was EPA given at least 30 days notice of any initial emissions tests?<br>[Note: This is required by 40 CFR 61.13(c).] |
| 12. | | | | 12. | If initial emissions testing was performed, were the samples analyzed and emissions determined within 30 days of the tests and the results sent to EPA within 31 days of the test?<br>[Note: This is required by 40 CFR 61.13(f).] |
| 13. | | | | 13. | Have all records of emissions tests results been maintained for at least two years?<br>[Note: This is required by 40 CFR 61.13(g).] |

| | | | | | |
|---|---|---|---|---|---|
| 14. | | | | 14.A | At all release points that have the potential to discharge radionuclides into the air in quantities that could cause an effective dose equivalent greater than 0.1 mrem/yr, were the following radionuclide emissions measurements made? |
| | | | | 14.B | Were periodic confirmatory measurements made at all other release points? |
| | | | | 14.C | Were all radionuclides that could contribute greater than 10% of the potential effective dose equivalent for a release point measured as prescribed below?<br><br>[Note: This is required by 40 CFR 61.93(b)(4)]<br><br>1. Effluent flow rate measurements to determine velocity and volumetric flow rates for stacks and large vents (a stack greater than approximately 0.3 meter in diameter or a stack or a vent with a cross-sectional area greater than approximately 0.071 square meter) were made in the following manner and under the following conditions?<br><br>A. The measurements were made at least eight stack diameters, or equivalent diameters, downstream and two diameters, or equivalent diameters, upstream from any flow disturbances or from a visible flame. If this was not possible, an alternative measurement point at least two stack diameters downstream and more than a half diameter upstream from a flow disturbance was used. If the opening is rectangular, the equivalent diameter is equal to: 2 x length x width/(length + width).<br><br>B. The measurements were made using: a type S pitot tube, a differential pressure gauge, a temperature gauge, a pressure probe and gauge, a barometer, gas density measuring equipment, and, if necessary, a calibration pitot tube and a differential pressure gauge for type S pitot tube calibration. This equipment was used in the manner and met the specifications of 40 CFR Part 60, appendix A, method 2, sections 2 through 4, inclusive.<br><br>C. Based upon the measurements referred to immediately above, the calculations required by 40 CFR Part 60, Appendix A, method 2, section 5 were made.<br><br>D. If the flow rates were variable, continuous or frequent measurements were made. Otherwise, periodic measurements were made. |

| | | | | |
|---|---|---|---|---|
| 14. (Contd) | | | | 14.C 2. Were effluent flow rate measurements to determine velocity and volumetric flow rates through pipes and small vents made in the following manner and under the following conditions?<br><br>A. Either in-line or at the exhaust, wherever the measurements were made, the temperature was between 0 and 50 degrees C.<br><br>B. The measurements were made using: a gas volume meter, a barometer, and a stopwatch. This equipment was used in the manner and met the specifications of 40 CFR Part 60, Appendix A, method 2A, sections 2 through 4, inclusive.<br><br>C. Based upon the measurements referred to immediately above, the calculations required by 40 CFR Part 60, Appendix A, method 2A, section 5 were made.<br><br>D. If the flow rates were variable, continuous or frequent measurements were made. Otherwise, periodic measurements were made.<br><br>3. Were radionuclides directly monitored or extracted, collected and measured in the following manner?<br><br>A. The measurements were made at least eight stack diameters, or equivalent diameters, downstream and two diameters, or equivalent diameters, upstream from any flow disturbances or from a visible flame (the "eight and two criterion"). If this was not possible, an alternative measurement point at least two stack diameters downstream and more than a half diameter upstream from a flow disturbance was used. If the opening is rectangular the equivalent diameter is equal to: 2 x length x width/(length + width).<br><br>B. If the eight and two criterion was met, the minimum number of traverse points was: twelve for stacks with diameters or, in the case of rectangular stacks, equivalent diameters greater than .61 meters; eight for circular stacks with diameters between .30 and .61 meters; and, nine for rectangular stacks with equivalent diameters between .30 and .61 meters.<br><br>C. If the eight and two criterion were not met, the number of traverse points was determined in accordance with 40 CFR Part 60, Appendix A, Method 1, Figure 1-1, in the case of particulates, and Figure 1-2, in the case of non-particulates.<br><br>D. Monitoring or sampling sites were otherwise in conformance with 40 CFR Part 60, Appendix A, Method 1. |

| | | | | |
|---|---|---|---|---|
| 14. (Contd) | | | | 14.C E. For batch processes when the unit is in operation and unless otherwise authorized by EPA, the effluent stream was monitored continuously with an in-line detector or representative samples were continuously withdrawn in accordance with ANSI-N13.1-1969, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities."<br><br>4. Did the stack monitoring and sample collection methods conform to the following guidelines established in 40 CFR Part 61, Appendix B, Method 114?<br><br>A. Radionuclides of most elements in effluent streams will be particulates and can be collected using a suitable filter. Radionuclides of hydrogen, oxygen, carbon, nitrogen, the noble gases, and, in some circumstances, iodine will be gases. Radionuclides of these elements will require either the use of an in-line or off-line monitor to directly measure the radionuclides, or suitable sorbers, condensers or bubblers to collect the radionuclides.<br><br>1. Particulates. The extracted effluent stream is passed through a filter media to remove the particulates. The filter must have a high efficiency for removal of sub-micron particles. The guidance in ANSI N13.1-1969 shall be followed in using filter media to collect particulates.<br><br>2. Gases.<br><br>a. Tritium. Tritium in the form of water vapor is collected from the extracted effluent sample by sorption, condensation or dissolution techniques. Appropriate collectors may include silica gel, molecular sieves, and ethylene glycol or water bubblers. Tritium in the gaseous form may be measured directly in the sample stream using direct counting in flow through ionization chambers, collected as a gas sample or may be oxidized using a metal catalyst to tritiated water and collected as described above.<br><br>b. Radionuclides of Iodine. Iodine is collected from an extracted sample by sorption or dissolution techniques. Appropriate collectors may include charcoal, impregnated charcoal, metal zeolite and caustic solutions.<br><br>c. Radionuclides of Argon, Krypton and Xenon. Radionuclides of these elements are either measured directly by an in-line or off-line monitor, or are collected from the extracted sample by low temperature sorption techniques. Appropriate sorbers include charcoal or metal zeolite. |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 14. (Contd) | | | | 14.C | d. Radionuclides of Oxygen, Carbon, Nitrogen and Radon. Radionuclides of these elements are measured directly using an in-line or off-line monitor. Radionuclides of carbon in the form of carbon dioxide may be collected by dissolution in caustic solutions.<br><br>B. The type of method applicable to the analysis of a radionuclide is dependent upon the type of radiation emitted, i.e., alpha, beta or gamma. Therefore, the methods listed below are grouped according to principles of measurements for the analysis of alpha, beta and gamma emitting radionuclides. Furthermore, each method has its limitations and should only be used as described in Method 114. For example, for I-123 and I-131 all four methods below are approved, whereas for I-125 only high resolution gamma spectrometry is approved.<br><br>1. Methods for Alpha Emitting Radionuclides: Radiochemistry-Alpha Spectrometry, Radiochemistry-Alpha Counting, Direct Alpha Spectrometry. Direct Alpha Counting (Gross alpha determination), and Chemical Determination of Uranium (by either colorimetry or fluorometry).<br><br>2. Methods for Gaseous Beta Emitting Radionuclides: Direct Counting in Flow-Through Ionization Chambers and Direct Counting With In-line or Off-line Beta Detectors.<br><br>3. Methods for Non-Gaseous Beta Emitting Radionuclides: Radiochemistry Beta Counting, Direct Beta Counting (Gross Beta determination), and Liquid Scintillation Spectrometry.<br><br>4. Gamma Emitting Radionuclides: High Resolution Gamma Spectrometry, Low Resolution Gamma Spectrometry, Single Channel Gamma Spectrometry, and Gross Gamma Counting. |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 15. | | | | 15. | Were all counters calibrated for specific radionuclide measurements using a standard of the radionuclide under either identical, or very similar, conditions as the sample to be counted as required by Method 114 and as outlined below? |
| | | | | 15.A | For gamma spectrometers, a series of standards covering the energy range of interest may be used to construct a calibration curve relating gamma energy to counting efficiency. |
| | | | | 15.B | In those cases where a standard is not available for a radionuclide, counters may be calibrated using a standard with energy characteristics as similar as possible to the radionuclide to be measured. For gross alpha and beta measurements of unidentified mixtures of radionuclides, alpha counters are calibrated with a natural uranium standard and beta counters with a cesium-137 standard. The standard must contain the same weight and distribution of solids as the samples, and be mounted in an identical manner. If the samples contain variable amounts of solids, calibration curves relating weight of solids present to counting efficiency are prepared. |
| 16. | | | | 16. | Does the facility have a radionuclide emissions quality assurance program that includes the following requirements? |
| | | | | 16.A | The organizational structure, functional responsibilities, levels of authority and lines of communications for all activities related to the emissions measurement program shall be identified and documented. |
| | | | | 16.B | Administrative controls shall be prescribed to ensure prompt response in the event that emission levels increase due to unplanned operations. |
| | | | | 16.C | The sample collection and analysis procedures used in measuring the emissions shall be described including where applicable:<br>1. Identification of sampling sites and number of sampling points, including the rationale for site selections.<br>2. A description of sampling probes and representativeness of the samples.<br>3. A description of any continuous monitoring system used to measure emissions, including the sensitivity of the system, calibration procedures and frequency of calibration.<br>4. A description of the sample collection systems for each radionuclide measured, including frequency of collection, calibration procedures and frequency of calibration.<br>5. A description of the laboratory analysis procedures used for each radionuclide measured, including frequency of analysis, calibration procedures and frequency of calibration. |

| | | | | | |
|---|---|---|---|---|---|
| 16. (Contd) | | | | | 6. A description of the sample flow rate measurement systems or procedures, including calibration procedures and frequency of calibration. |
| | | | | | 7. A description of the effluent flow rate measurement procedures, including frequency of measurements, calibration procedures and frequency of calibration. |
| | | | | 16.D | The objectives of the quality assurance program shall be documented and shall state the required precision, accuracy and completeness of the emission measurement data including a description of the procedures used to assess these parameters. Accuracy is the degree of agreement of a measurement with a true or known value. Precision is a measure of the agreement among individual measurements of the same parameters under similar conditions. Completeness is a measure of the amount of valid data obtained compared to the amount expected under normal conditions. |
| | | | | 16.E | A quality control program shall be established to evaluate and track the quality of the emissions measurement data against preset criteria. The program should include where applicable a system of replicates, spiked samples, split samples, blanks and control charts. The number and frequency of such quality control checks shall be identified. |
| | | | | 16.F | A sample tracking system shall be established to provide for positive identification of samples and data through all phases of the sample collection, analysis and reporting system. Sample handling and preservation procedures shall be established to maintain the integrity of samples during collection, storage and analysis. |
| | | | | 16.G | Periodic internal and external audits shall be performed to monitor compliance with the quality assurance program. These audits shall be performed in accordance with written procedures and conducted by personnel who do not have responsibility for performing any of the operations being audited. |
| | | | | 16.H | A corrective action program shall be established including criteria for when corrective action is needed, what corrective actions will be taken and who is responsible for taking the corrective action. |
| | | | | 16.I | Periodic reports to responsible management shall be prepared on the performance of the emissions measurements program. These reports should include assessment of the quality of the data, results of audits and description of corrective actions. |

| | | | | | |
|---|---|---|---|---|---|
| 17. | | | ☐ | 17.A | If a computer code, model, or program was used to determine compliance with 40 CFR 61.92 (the 10 mrem/yr ede standard) what input parameters were used? |
| | | | ☐ | 17.B | If CAP-88 was not used, what code, model, or program was used? |
| | | | | 17.C | If the code, model, or program was not CAP-88, AIRDOS-PC, or COMPLY, was the approval of EPA obtained prior to it's being used to determine compliance? |
| | | | | 17.D | If COMPLY was used, does -- or at the time, did -- the maximally exposed individual live within three kilometers of all sources of emissions at the facility?<br><br>[Note: 40 CFR 61.93 provides that one of the above referenced models or an other model previously approved by EPA may be used to determine compliance with 40 CFR 61.92.] |
| 18. | | | ☐ | 18. | In addition to all input parameters, please also provide a copy of the code, program, or model used to determine compliance with 40 CFR 61.92. |
| 19. | | | | 19.A | Has all documentation, including all measurements, calculations, and analytical methods, from which the facility derived the input parameters used in making the calculation of the effective dose equivalent received by any member of the public in a year been maintained at the site? |
| | | | ☐ | 19.B | If so, please provide copies of same or access to the originals.<br><br>[Note: 40 CFR 61.95 requires that the above documentation be maintained at the site for at least five years. The documentation is required to be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with 40 CFR 61.92.] |
| 20. | | | | 20.A | If air dispersion calculations were not performed to determine compliance with 40 CFR 61.92, was the alternative procedure in 40 CFR 61.93(b)(5) (measurement of radionuclide air concentrations at critical receptor locations) used instead? |
| | | | ☐ | 20.B | If so, was prior EPA approval obtained? |
| | | | | 20.C | If so, please provide the sampling and analytical methodology and data used to make the determination of whether the 10 mrem/yr ede standard was being met. |
| 21. | | | | 21.A | Provide the results of any air sampling for radionuclides that was performed and the sampling and analytical methodology used. |
| | | | | 21.B | Where were the samples taken and what was being sampled? |

| | | | | | |
|---|---|---|---|---|---|
| 22. | | | | 22. | Has a report been submitted each year, by June 30, from the facility to EPA headquarters and the appropriate Regional Office containing the following information: |
| | | | | 22.A | The results of the monitoring as recorded in DOE's Effluent Information System? |
| | | | | 22.B | Dose calculations for the previous year using an approved computer program, model or code? |
| | | | | 22.C | The name and location of the facility? |
| | | | | 22.D | A list of the radioactive materials used at the facility? |
| | | | | 22.E | A description of radioactive material handling and processing? |
| | | | | 22.F | A list of stacks and vents and other points where radioactive materials are released to the atmosphere? |
| | | | | 22.G | A description of the effluent controls and their efficiency? |
| | | | | 22.H | Distance of each release point from the nearest school, office, business, or residence and the nearest farms producing vegetables, milk, or meat? |
| | | | | 22.I | Values of user supplied input parameters and source thereof? |
| | | | | 22.J | All construction and modifications that were completed during the calendar year for which the report was prepared and for which approval was waived by EPA and documentation used to support the waiver request?<br><br>[Note: This report is required by 40 CFR 61.94] |
| 23. | | | | 23. | If the report referred to in question 24 above was submitted for each year, as required, was it signed by a corporate officer or public official in charge of the facility and did that official acknowledge that statements made in the report were subject to the provisions of 18 USC 1001? |
| 24. | | | | 24.A | Was the facility not in compliance with the 10 mrem/yr ede standard for any calendar year covered by a report referred to above in question 24? |
| | | | | 24.B | If so, were reports detailing compliance efforts submitted each month to EPA?<br><br>[Note: This is required by 40 CFR 61.94(c).] |

# APPENDIX B

# RADIONUCLIDE NESHAPS INFORMATION CHECKLIST - TECHNICAL

Radionuclide NESHAPs Information Checklist - Technical

Facility Name: _____ Building Name: _____

Facility Contact: _____ Phone: _____

**FOR EACH RELEASE POINT:**

**1. FACILITY/BUILDING DESCRIPTION:**

1a. Describe the material handled and operations performed.

_____
_____
_____
_____

1b. Provide a schematic of the stack(s) and flow measurement monitoring locations.

_____
_____
_____
_____
_____

Additional info attached: Yes/No

1c. Provide stack physical parameters.

| | Stack | Stack | Stack |
|---|---|---|---|
| Height above ground: | | | |
| Stack diameter: | | | |
| If heated exhaust: cal/sec | | | |
| If tall stack: exit temp. | | | |
| Exit velocity | | | |
| If stack is on a building: | | | |
| Height above building: | | | |
| Building length: | | | |
| Building width: | | | |

1d. Describe the potential for fugitive emissions.

_____
_____
_____
_____

Additional info attached: Yes/No

1e. Identify the applicable QA/QC program/procedures.

_____
_____
_____
_____
_____

Additional info attached: Yes/No

## 2. RADIOACTIVE SOURCE TERMS

2a. Provide the quantity and forms of each radionuclide handled in Curies (excluding sealed sources), with maximums and daily averages.

| Annual thruput: | Solids | Liq/Pdr | Gases | Special* |
|---|---|---|---|---|
| 199__ | | | | |
| 199__ | | | | |
| 199__ (___mos.) | | | | |

* Describe, including processing. _____

Data attached: Yes/No Not Available

2b. Describe, provide, and/or reference the procedure for assigning radioactive material to i, ii, iii physical states (App D2(b)).

Additional info attached: Yes/No

2c. Describe any adjustments and all assumptions applied to effluents as a result of effluent controls (App D, Table 1).

Additional info attached: Yes/No

2d. Provide records to justify source term determinations.

Additional info attached: Yes/No

2e. Identify the applicable QA/QC program/procedures.

Additional info attached: Yes/No

## 3. RADIOACTIVE EFFLUENT MONITORING/SAMPLING

### 3A. STACK MONITORING

3Aa. Describe the stack monitoring/sampling system and procedure for flow and radionuclide measurements, including frequency of measurement.

Additional info attached: Yes/No

3Ab. Is the level of monitoring consistent with estimated PEDE category? Yes/No

Additional info attached: Yes/No

3Ac. Provide the airborne effluent (stack) monitoring/sampling data.

Data attached: Yes/No Not Available

3Ad. Describe the effluent control system.

Additional info attached: Yes/No

3Ae. Provide records to justify decisions and assumptions affecting the performance of the stack monitoring system.

Additional info attached: Yes/No

3Af. Identify the applicable QA/QC program/procedures, including those for locating, maintaining, and calibrating radionuclide monitors.

Additional info attached: Yes/No

**3B. AREA, VENT, AND HOOD MONITORING (if not routed to stack)**

3Ba. Describe in-plant area monitoring/sampling data, if any.

Data attached: Yes/No Not Available

3Bb. Describe hood monitoring sampling data, if any.

Data attached: Yes/No Not Available

3Bc. Describe effluent control system efficiencies.

Additional info attached: Yes/No

3Bd. Describe calculations used to demonstrate compliance with MPC.

Additional info attached: Yes/No

3Be. Identify the applicable QA/QC program/procedures.

Additional info attached: Yes/No

## 3C. ENVIRONMENTAL MONITORING

3Ca. If environmental measurements are made, describe the program:

Additional info attached: Yes/No

3Cb. Provide airborne radionuclide monitoring/sampling data.

Data attached: Yes/No Not Available

3Cc. Describe location of sampling/monitoring points.

Additional info attached: Yes/No

3Cd. Identify the applicable QA/QC program/procedures.

Additional info attached: Yes/No

## 4. ANALYTICAL PROCESSES

4a. Provide information and data sufficient to allow analysis of the results of the environmental monitoring system, including all assumptions.

Additional info attached: Yes/No

4b. Provide information and data sufficient to allow analysis of the results of the particulate sampling programs, including all assumptions.

Additional info attached: Yes/No

4c. Provide information and data sufficient to allow analysis of the results of all relevant laboratory work, including all assumptions.

Additional info attached: Yes/No

## 5. DOSE STANDARD

5a. Which code was used? The facility must use CAP88-PC if the distance to the closest resident is greater than 3000 meters.

Additional info attached: Yes/No

5b. If the facility's releases are measured in terms of gross activity, how was the release quantity of each nuclide determined?

Additional info attached: Yes/No

5c. How did the facility treat multiple release points?

Additional info attached: Yes/No

5d. What is the source of the facility's meteorological data?

Additional info attached: Yes/No

5e. Did the facility change any of the default pathway parameters in CAP88-PC?

Additional info attached: Yes/No

5f. How did the facility determine the distances from the release point to the closest resident in each sector? How did the facility determine the distances to the nearest farms raising produce, milk and meat?

Additional info attached: Yes/No

5g. Was CAP88-PC used to estimate the dose to a resident who is closer than 100 meters to the release point?

Additional info attached: Yes/No

5h. Is the terrain complex?

Additional info attached: Yes/No

5i. Describe distances and directions to nearest residences, offices or schools.

| Direction | Receptor Dist. | Direction | Receptor Dist. |
|---|---|---|---|
| ____ to N | | ____ to S | |
| ____ to NNE | | ____ to SSW | |
| ____ to NE | | ____ to SW | |
| ____ to ENE | | ____ to WSW | |
| ____ to E | | ____ to W | |
| ____ to ESE | | ____ to WNW | |
| ____ to SE | | ____ to NW | |
| ____ to SSE | | ____ to NNW | |

5j. Distances and directions to nearest farms.

| Direction | Farm Dist/Type | Direction | Farm Dist/Type |
|---|---|---|---|
| ____ to N | | ____ to S | |
| ____ to NNE | | ____ to SSW | |
| ____ to NE | | ____ to SW | |
| ____ to ENE | | ____ to WSW | |
| ____ to E | | ____ to W | |
| ____ to ESE | | ____ to WNW | |
| ____ to SE | | ____ to NW | |
| ____ to SSE | | ____ to NNW | |

5k. Provide site meteorological data (wind rose, wind speeds), if any.

| Direction | FREQ | SPD | Direction | FREQ | SPD |
|---|---|---|---|---|---|
| ____ to N | _____ | _____ | ____ to S | _____ | _____ |
| ____ to NNE | _____ | _____ | ____ to SSW | _____ | _____ |
| ____ to NE | _____ | _____ | ____ to SW | _____ | _____ |
| ____ to ENE | _____ | _____ | ____ to WSW | _____ | _____ |
| ____ to E | _____ | _____ | ____ to W | _____ | _____ |
| ____ to ESE | _____ | _____ | ____ to WNW | _____ | _____ |
| ____ to SE | _____ | _____ | ____ to NW | _____ | _____ |
| ____ to SSE | _____ | _____ | ____ to NNW | _____ | _____ |

Source: _____

5l. Identify the applicable QA/QC program/procedures.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Additional info attached: Yes/No

Names of inspectors: _____

_____

_____

Date: _____

Additional comments and overall impressions of the operations as applicable:

# APPENDIX C

## RADIONUCLIDE NESHAPS INFORMATION CHECKLIST - QA

Radionuclide NESHAPs Information Checklist - QA

Facility Name: _____ Building Name: _____

Facility Contact: _____ Phone: _____

## QUALITY ASSURANCE

### 1. Quality Assurance Program - General Questions:

REQT: The quality assurance program should be documented in a quality assurance project plan which addresses each of the requirements in 10 CFR Part 61, Appendix B, Method 114, Section 4. [Pt. 61, App B, Meth. 114, §4.10]

PURPOSE: To cause the project manager to articulate the actions necessary to plan and implement an effective quality assurance program.

a. Has the project established an effective QA program prior to the start of work?

_____
_____
_____
_____
_____

b. In instances where the project chooses to use existing data (such as existing computer codes), have measures been described to validate and/or corroborate the data before its use?

_____
_____
_____
_____
_____

c. Has the project written or scheduled the writing of the policies, procedures, and instructions such that the documented directions are to be in place before work starts?

_____
_____
_____
_____
_____

d. Has the project identified items and activities important to the accomplishment of the performance objectives stated in the application for permits which are to be covered by the QA program?

e. Has the project provided for the qualified personnel, appropriate equipment, suitable environmental conditions for accomplishing planned work, and verification and inspection of the completed work?

f. Has the project provided for timely measurement and assessment of the effectiveness of the QA program implementation, and are actions to be taken to correct deficiencies and prevent their recurrence?

g. Have the program objectives that must be met been determined and listed?

h. Have the necessary internal and external interfaces with regulators, legislative groups, intervenors, local citizens groups, and appointed technical oversight committees been recognized?

i. Once the total job is understood and can be articulated by the Program Manager, has the organization been structured, functions assigned, and plans formulated that integrate the actions to accomplish the objectives?

j. Is it recognized that the single most important characteristic of an effective quality assurance program is a project manager who accepts full responsibility for the quality of the end product and who carefully assigns the achievement and assurance of the end product quality to a capable and trained staff?

k. Has careful planning and preparation of procedures for activities to accomplish the technical and administrative objectives been accounted for?

l. Has the project designed and planned to use "sensors" in the management systems to permit "real-time" measurement of the effectiveness of implementation of the planned actions and timely adjustment by management controls to correct for anomalies?

## 2. Organizational Structure

REQT: The organizational structure, functional responsibilities, levels of authority and lines of communications for all activities related to the emissions measurement program shall be identified and documented. [Pt. 61, App B, Meth. 114, §4.1]

PURPOSE: (1) To identify all quality affecting activities and to assure that key personnel responsibilities and authorities are clear.

(2) To oversee and control the work of contractors and suppliers and to ensure that the results are consistent with the accomplishment of the performance objectives.

a. Does the project's QA program description reflect full comprehension of the performance objectives of the regulations, and have authorities been effectively assigned to ensure accomplishment of the performance objectives?

Additional info attached: Yes/No

b. Has the project manager made a commitment to comply with regulatory requirements, and is this reflected in the assignment of functional authorities?

Additional info attached: Yes/No

c. Does the project provide for maintaining control over work performed by contractors and suppliers that affects the accomplishment of the performance objectives of the regulations and design bases?

Additional info attached: Yes/No

d. Has the project designed an organization and assigned functions and authorities such that the achievement and assurance of quality are integrated and are a part of everyday work activities?

Additional info attached: Yes/No

e. Does the project assign an individual to be responsible for the development, implementation, and assurance of continued effectiveness of the QA program? Does the individual have organizational freedom to carry out the assignment?

Additional info attached: Yes/No

f. Does the project manager retain full responsibility and accountability for the overall quality assurance program? Is the project manager responsible and accountable for the end product quality?

Additional info attached: Yes/No

g. If contractors are used:

1. Does the project ensure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to procurement documents?

Additional info attached: Yes/No

2. Does the project ensure that documented evidence of review and acceptance of the purchased material, equipment, or service is retained and is available for review?

Additional info attached: Yes/No

3. Does the project assess the effectiveness of the control of quality by contractors and subcontractors?

Additional info attached: Yes/No

4. Does the project assure that applicable performance objectives, and other requirements which are necessary to assure adequate quality are suitably included or referenced in documents for procurement of material, equipment, and services, whether purchased by the project or by its contractors and subcontractors?

Additional info attached: Yes/No

5. Does the project require contractors and subcontractors to have quality assurance programs commensurate with the importance of the work assigned to the accomplishment of the performance objectives?

Additional info attached: Yes/No

6. Does the project ensure that the contractor and supplier QA programs are reviewed for adequacy?

Additional info attached: Yes/No

7. Does the project describe the organization responsibilities for (1) procurement planning; (2) the preparation, review, approval, and control of procurement documents; (3) supplier selection; (4) bid evaluations; (5) review and concurrence of supplier QA programs prior to the initiation of activities affected by the program?

Additional info attached: Yes/No

8. Is the role of the QA organization described?

Additional info attached: Yes/No

## 3. Administrative Controls

REQT: Administrative controls shall be prescribed to ensure prompt response in the event that emission levels increase due to unplanned operations. [Pt. 61, App B, Meth. 114, §4.2]

PURPOSE: (1) To ensure the use of formal instructions for work activities related to the accomplishment of performance objectives.

(2) To ensure that documents prescribing activities related to the accomplishment of the performance objectives are controlled during review, approval, and distribution to ensure that those performing activities have only approved and up-to-date instructions.

a. Provide an example of the administrative control called for in this requirement.

Additional info attached: Yes/No

## 4. Sample Collection and Analysis

REQT: The sample collection and analysis procedures used in measuring the emissions shall be described including where applicable [Pt. 61, App B, Meth. 114, §4.3]:

1. Identification of sampling sites and number of sampling points, including the rationale for site selections. [§4.3.1]

2. A description of sampling probes and representativeness of the samples. [§4.3.2]

3. A description of any continuous monitoring system used to measure emissions, including the sensitivity of the system, calibration procedures and frequency of calibration. [§4.3.3]

4. A description of the sample collection systems for each radionuclide measured, including frequency of collection, calibration procedures and frequency of calibration. [§4.3.4]

5. A description of the laboratory analysis procedures used for each radionuclide measured, including frequency of analysis, calibration procedures and frequency of calibration. [§4.3.5]

6. A description of the sample flow rate measurement systems or procedures, including calibration procedures and frequency of calibration. [§4.3.6]

7. A description of the effluent flow rate measurement procedures, including frequency of measurements, calibration procedures and frequency of calibration. [§4.3.7]

PURPOSE: (1) To ensure that all work activities important to the accomplishment of performance objectives are controlled, including activities requiring specially trained personnel, equipment, or procedures.

(2) To ensure that appraisals affecting the quality of work related to the accomplishment of the performance objectives are taken only with instruments, tools, gauges, or other measuring devices that are accurate, controlled, calibrated, and adjusted at predetermined intervals to maintain accuracy within necessary limits.

a. Does the project establish a test program to assure that all testing to demonstrate that systems and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptable limits contained in design documents?

Additional info attached: Yes/No

b. Does the project establish a planned program for sampling and testing and ensure the precision, accuracy, and repeatability of the analytical data?

Additional info attached: Yes/No

c. Does the project document and evaluate test results to assure that requirements have been satisfied?

Additional info attached: Yes/No

d. Does the project document the plans, procedures, results, and verification of tests?

Additional info attached: Yes/No

## 5. QA Objectives

REQT: The objectives of the quality assurance program shall be documented and shall state the required precision, accuracy and completeness of the emission measurement data including a description of the procedures used to assess these parameters. Accuracy is the degree of agreement of a measurement with a true or known value. Precision is a measure of the agreement among individual measurements of the same parameters under similar conditions. Completeness is a measure of the amount of valid data obtained compared to the amount expected under normal conditions. [Pt. 61, App B, Meth. 114, §4.4]

a. Provide an example of the administrative control called for in this requirement.

Additional info attached: Yes/No

## 6. Emissions Measurement Data

REQT: A quality control program shall be established to evaluate and track the quality of the emissions measurement data against preset criteria. The program should include where applicable a system of replicates, spiked samples, split samples, blanks and control charts. The number and frequency of such quality control checks shall be identified. [Pt. 61, App B, Meth. 114, §4.5]

a. Provide an example of the administrative control called for in this requirement.

Additional info attached: Yes/No

## 7. Sample Tracking

REQT: A sample tracking system shall be established to provide for positive identification of samples and data through all phases of the sample collection, analysis and reporting system. Sample handling and preservation procedures shall be established to maintain the integrity of samples during collection, storage and analysis. [Pt. 61, App B, Meth. 114, §4.6]

PURPOSE: To ensure control over handling, storage, cleaning, packaging, preservation, and shipping of items affecting the quality of work related to the accomplishment of the performance objectives.

a. Provide an example of the administrative control called for in this requirement.

Additional info attached: Yes/No

## 8. Audits

REQT: Periodic internal and external audits shall be performed to monitor compliance with the quality assurance program. These audits shall be performed in accordance with written procedures and conducted by personnel who do not have responsibility for performing any of the operations being audited. [Pt. 61, App B, Meth. 114, §4.7]

PURPOSE: To ensure that audits, which are part of the management system's sensors, are effective by being well planned, conducted by trained personnel familiar with the work being audited, and designed to measure the potential of the activity or process being audited to produce an acceptable product.

a. Provide an example of the administrative control called for in this requirement.

Additional info attached: Yes/No

## 9. Corrective Actions

REQT: A corrective action program shall be established including criteria for when corrective action is needed, what corrective actions will be taken and who is responsible for taking the corrective action. [Pt. 61, App B, Meth. 114, §4.8]

PURPOSE: (1) To ensure that items not conforming to specified requirements are identified and controlled to prevent inadvertent use. (2) To ensure that management systems that comprise the QA program are constantly monitored and that timely corrective measures are taken to correct conditions adverse to quality.

a. Does the project establish measures to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances, are promptly identified and corrected?

Additional info attached: Yes/No

b. Does the project provide for identification and documentation of significant conditions adverse to quality (i.e., a nonconformance or adverse condition which, if left uncorrected, could have a serious effect on safety, reliability, or performance), the cause of the condition, and the corrective action taken? Are appropriate levels of management notified?

Additional info attached: Yes/No

**10. Reporting**

REQT: Periodic reports to responsible management shall be prepared on the performance of the emissions measurements program. These reports should include assessment of the quality of the data, results of audits and description of corrective actions. [Pt. 61, App B, Meth. 114, §4.9]

a. Provide an example of a periodic report to management.

Additional info attached: Yes/No

Names of inspectors: _____

_____

_____

Date: _____

Additional comments and overall impressions of the operations as applicable: _____

# APPENDIX D

# EXAMPLE INSPECTION REPORT FORMAT - ANNOTATED

Example Inspection Report Format - Annotated

SUMMARY OF COMPLIANCE FINDINGS

Summarize each technical and administrative area in Section 3 for which there has been a compliance finding.

1. INTRODUCTION

1.1 Background

1.2 Purpose and Scope of Inspection

The information for these sections may be obtained directly from the Inspection Plan.

2. INSPECTION PROCESS

Describe the Inspection Plan, the inspection topics, inspection documentation, and inspection team. For inspection topics, the following should be considered for each technical area inspected:

Radioactive Sources

- Determine the criteria for identifying the sources and/or stacks being monitored.
- Determine the criteria/rationale for all sources and/or stacks not being monitored.

Radionuclide Air Emissions Monitoring

- Inspect all stack monitoring systems.
- Inspect stacks not being monitored using spot-checks.
- Inspect potential fugitive emissions areas, including environmental monitoring systems.

Analytical/Sampling Processes

- Analyze the results of particulate sampling programs.
- Analyze the results of laboratory work.

Dose Assessment

- Analyze CAP-88 inputs used by facility.
- Identify and obtain data necessary to perform independent dose calculations.
- Perform independent dose calculations using data obtained on-site

Quality Assurance

- Assess activities for compliance with quality assurance methods requirements.

## 3. STATEMENT OF FACTS

The purpose of this section is (1) to summarize the facts observed during the EPA's inspection, and (2) to state the applicable regulatory requirements.

The section is organized around several key NESHAP topics: overall compliance, sources of radioactive emissions, emissions measurements, emissions sampling and analytical processes, the dose standard, and quality assurance.

Additional detail on regulatory requirements and a summary of facts observed during the audit can be found in Appendices A and C, respectively.

3.1 Overall NESHAP Compliance

3.2 Radioactive Sources

3.3 Radioactive Air Effluent Monitoring/Sampling

3.4 Analytical Processes

3.5 Dose Standards

3.6 Quality Assurance

## APPENDIX A REGULATORY REQUIREMENTS CHECKLIST

This appendix should differ in no significant way from Appendix A of the Inspection Plan.

## APPENDIX BDESCRIPTIONS OF RELEASE POINTS INSPECTED

Descriptions of the technical processes being conducted giving rise to radioactive releases. This Appendix may not be required for relatively small, non-complex facilities. For the latter, a description should be provided in the body of the Inspection Report.

## APPENDIX C INSPECTION SUMMARIES

Inspection summaries are written by the individual team inspectors who were granted responsibility for coordinating inspections of specific release points. The inspection summaries integrate the information obtained from the technical and/or QA checklists with all other information obtained on-site pertaining to a specific release point. The inspection summaries are relatively detailed compared to the main body of the Inspection Report.

## REFERENCES

All material relied upon to make a compliance finding should be traceable.